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BART IMPACT PROGRAM

WHO ARE THE TRANSPORTATION DISADVANTAGED?

WORKING PAPER

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Prepared by Dr. Chester McGuire under contract to
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16. Abstract

Who are the transportation disadvantaged? The author proposes the definition: those groups whose same opportunities for development have been hindered, either by omission or commission, by deficiencies in the transportation system. He then asks the question of whether those conditions which make an individual disadvantaged within the general societal context are the same conditions which make one transportation disadvantaged. He discusses income, disability, place of residence and place of employment, automobile accessibility, race, sex, and age as factors which may contribute to transportation disadvantage.

He concludes that only a tenuous case at best can be made that the poor, minorities, handicapped, elderly, women, and youth are really "transportation disadvantaged", but that these groups have certain general disadvantages vis-a-vis society which make them of special concern, in an equity sense, in planning a transportation system.

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SAN FRANCISCO BAY REGION

CENTRAL AREA

Metropolitan Transportation Commission

BART: THE BAY AREA RAPID TRANSIT SYSTEM

Length: The 71-mile system includes 20 miles of subway, 24 miles on elevated structures and 27 miles at ground level. The subway sections are in San Francisco, Berkeley, downtown Oakland, the Berkeley Hills Tunnel and the Transbay Tube.

Stations: The 34 stations include 13 elevated, 14 subway and 7 at ground level. They are spaced at an average distance of 2.1 miles: stations in the downtowns are less than ½-mile apart while those in suburban areas are 2 to 4 miles apart. Parking lots at 23 stations have a total of 19,000 spaces. There is a fee (25¢) at only one of the parking lots. BART and local agencies provide bus service to all stations.

Trains: Trains are from 4 to 10 cars long. Each car is 70 feet long and has 72 seats. Top speed is 80 mph with an average speed of 38 mph including station stops. All trains stop at all stations on the route.

Automation: Trains are automatically controlled by the central computer at BART headquarters. A train operator on-board each train can over-ride automatic controls in an emergency.

Magnetically encoded tickets with values up to $20 are issued by vending machines. Automated fare gates at each station compute the appropriate fare and deduct it from the ticket value. At least one agent is present at each station to assist patrons.

Fares: Fares range from 25¢ to $1.45, depending upon trip length. Discount fares are available for the physically handicapped, children 12 and under and persons 65 and over.

Service: BART serves the counties of Alameda, Contra Costa and San Francisco, which have a combined population of 2.4 million. The system was opened in five stages, from September, 1972, to September, 1974. The last section to open was the Transbay Tube linking Oakland and the East Bay with San Francisco and the West Bay.

Routes are identified by the terminal stations: Daly City in the West Bay, Richmond, Concord and Fremont in the East Bay. Trains operate every 12 minutes during the daytime on three routes: Concord - Daly City, Fremont - Daly City, Richmond - Fremont. This results in 6-minute train frequencies in San Francisco, downtown Oakland and the Fremont line where routes converge. In the evening, trains are dispatched every 20 minutes on only the Richmond - Fremont and Concord - Daly City routes. Service is provided weekdays only, between 6 A.M. and midnight. Future service will include a Richmond - Daly City route and weekend service. Trains will operate every 6 minutes on all routes during the peak periods of travel.

Patronage: Approximately 130,000 one-way trips are made each day. 200,000 trips are anticipated under full service conditions.

Cost: BART construction and equipment cost $1.6 billion, financed primarily from local funds: $942 million from bonds being repaid by the property and sales taxes in the three counties, $176 million from toll revenues of transbay bridges, $315 million from federal grants, and $186 million from interest earnings and other sources.

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INTRODUCTION

The term "transportation disadvantaged" probably crept into the planners' vocabulary behind the same forces which ingratiated the concept to educators and social welfare bureaucrats. In education, the "disadvantaged" child has come to mean the black or Chicano pupil who either fails to achieve or fails to behave. Disadvantaged is a term which can be used to describe these children without recourse to racial or class descriptions. However, when used in this manner the term becomes a euphemism, a less direct way of saying black, Puerto Rican, Chicano, Asian, poor, etc.

Euphemisms such as disadvantaged often have diplomatic value in general parlance. Yet the problem with all such euphemisms is that they are too vague and imprecise to be useful in research. Disadvantaged by whom? Disadvantaged in relation to what? Also the degree of disadvantage varies among members of the same allegedly disadvantaged group. For instance, should all blacks be considered disadvantaged? Certainly many are: but there are large numbers of blacks who hardly fit the stereotype of disadvantaged. The same can be said of any ostensibly disadvantaged group or class.

In spite of its drawbacks the term disadvantaged does serve some purpose. For the time being let us accept it, albeit with some reservation. What we now need is at least one working definition of the term. Such an appropriate working definition of disadvantaged has been provided by Grebler, Moore and Guzman (1970):

> A category of people, then, can be defined as disadvantaged if society at large has acted by omission or commission to hinder a disproportionate number of its members in the development of their individual abilities.[1]

With this definition, it is the ultimate effects of society's actions, rather than the intent or purpose, which causes the disadvantaged status. If we can accept this precept the analysis can proceed without ever mentioning the words "racist," "sexist," "agist," or other such epithets. What we infer from this definition are general societal disadvantages, usually manifest in lower socioeconomic status of deprived groups.

Another point to be considered is the difference between individual and group disadvantage. All disadvantaged groups (racial minorities, handicapped, elderly, and women) are extremely pluralistic in their makeup. Individual abilities, motivations, and opportunities vary widely within any such groupings. The degree of individual disadvantage will have a wide range of variation across the group. All blacks do not appear similarly disadvantaged, because not all live in ghettos, are poor or are unaspiring or unlucky. While pursuing this line of reasoning we must understand that it is possible for a group to be considered disadvantaged, while acknowledging that we are referring to statistical aggregates within which there is significant variation.

The reason that the term transportation disadvantaged has crept into the vocabulary of the transportation planners is the need for an appellation for all of the people who need transportation in their daily lives but who also face one or more acute disadvantages in coping within the general society. Racial minorities face discrimination, the

handicapped face physical and psychological barriers, the elderly face compound problems because many are poor as well as discriminated against, and women confront disadvantages because of their sex in a male-dominated society. There is no doubt that in a general societal context these groups (minorities, elderly, handicapped, women) are disadvantaged vis-a-vis general society.

Does membership in one of these groups make one ipso facto disadvantaged? And, more to the point, does membership have anything to do with transportation disadvantage? When one begins to think about the context in which "transportation disadvantaged" is used, it becomes evident that there obviously exists a plethora of social conditions which must accompany race, sex, or other identification for individuals to be disadvantaged. Also the degree of disadvantage, which is a continuum, is conditioned by myriad other factors.

The Nature of Transportation Disadvantage

Just what constitutes transportation disadvantage? To answer this question, we should go back to the definition of general societal disadvantage. A variation of that definition would depict the transportation disadvantaged as those groups whose same opportunities for development have been hindered either by omission or commission, by deficiencies in the transportation system. As with all such definitions, this too lacks precision. Transportation system is not defined explicitly. But we can assume that the transportation system consists of all the physical capital and the political and social organizations which exist to facilitate the movement of people and goods. As such the system is broad indeed.

Are the conditions which make an individual disadvantaged within an overall societal context the same conditions which make one transportation disadvantaged? Another way to phrase the question is: Can a person who is part of a generally disadvantaged group be sufficient in terms of his/her need to travel? Conversely, can a person who is by all other attributes advantaged (in a social context) be transportation disadvantaged? Take an extreme case of the black psychiatrist who lives in a fashionable suburban area. Is he/she in any way disadvantaged? The occupational status and place of residence tends to indicate the opposite. What factor would make this person disadvantaged in a societal context? Would race be an appropriate reason to designate the person disadvantaged? Let us take this proposition a step further. Just what would make such a person as described transportation disadvantaged? This is obviously an extreme case, but it differs from the average only by degree, and not generically. There are classification problems to be encountered all along the various spectra in trying to determine just who is, or who is not, disadvantaged.

There is obviously some overlap between being socially disadvantaged and being transportation disadvantaged. Poverty seems to be one key variable which can indeed overlap. Poor people are socially disadvantaged, as well as transportation disadvantaged, in the sense that they may not be able to afford the transit fare or automobiles.

One way of assessing transportation disadvantage is to try to construct a composite of the person or family that is entirely sufficient in a transportation context. There are some obvious attributes which come to mind. First of all, the family would have an adequate income, which we might assume to be somewhere above the median. The transpor-

tation sufficient family would also be in reasonably good health with no serious defects or mobility impairments and be able to walk several blocks to a transit stop without assistance and without posing hazards to themselves. The adults would be physically able to drive a car. We would expect that the household would have one car for every adult member, what Foley (1972) has called the saturation level.[2] Thus, all members of the household would be potentially mobile all of the time. The family would live in a neighborhood that was immediately accessible by both automobile and public transportation. Amenities such as parks, schools, and shopping centers would be near. The place of work would be accessible by both automobile and by public transportation within some reasonable time and reasonable cost.

Such a family as described above would be very sufficient in terms of transportation. We are certain of this. Yet we really know very little about the family. We do not know race, education level, personal habits or any of the other things which make people interesting. We only know that by definition the family is not disadvantaged in any mobility sense. In fact the family is transportation sufficient.

Now comes the vexing and very nettlesome task of transforming this ideal family into one that is transportation disadvantaged. How can we do it? What characteristics need to be changed to make this family less well off transportationwise -- less well off enough to make it transportation disadvantaged? Doing this requires asking some very hard questions. For instance, at what level does income become a factor of disadvantage? Is it at the poverty level or higher? In the same vein, other questions can be posed concerning the degree of physical disability,

or the incidence of automobile ownership, or the accessibility of the place of residence or the place of employment. Since all of these factors affect transportation sufficiency, their absence, impairment or diminution contribute to some form of transportation disadvantage.

There is another whole set of issues that are also important when considering the subject of disadvantage, attributes of general societal disadvantage, which in turn may contribute to or exacerbate the lack of total transportation sufficiency. Factors such as race, sex or age may be such contributory agents. In the description of the prototypical transportation sufficient family no mention was made of race, sex of household head or age. Would these attributes by themselves contribute to transportation disadvantage? Or are they neutral? These are perhaps some of the more vexing issues to be considered under a rubric of "transportation disadvantaged."

Income as an Indicator of Disadvantaged Status

The most obvious determinant of status, or any other measure of relative advantage, is family or household income. With an adequate income the household is in a position to purchase a decent home, secure an education and take advantage of cultural and other opportunities for personal development. Certainly the absence of income (or wealth) may make it extremely difficult or impossible for an individual to lead an enriched life.

Two significant determinants of income are race and sex of family head. Table 1 below shows such a breakdown for households in the San Francisco-Oakland SMSA.

Table 1

Median Income in 1969 of Families by Type of Family, Race and Sex of Head

Families	Family Income
All Households	$11,956
Male Head	12,662
Female Head	5,995
Negro Families	7,964
Male Head	9,688
Female Head	3,923
Spanish Surname	10,539
Male Head	11,199
Female Head	5,144

Source: 1975 Census of Population.

Minorities traditionally have much lower incomes than whites. This is also depicted in Table 1, where both blacks and Spanish Surname families are shown to have lower incomes. As stated previously, lower income is an indication of relative lack of status, which relates to general societal disadvantage. In addition to race, sex is also significantly correlated with income. Table 1 shows that across races the female headed household has less than half of the income of the male headed household. Perhaps many reasons explain this situation. Women are less likely to have attained the same skill or opportunity as men in the higher paying occupations in business, the professions, and the arts. Without attempting to explain the myriad problems faced by women in a male dominated society (which in itself is a difficult undertaking) it can simply be stated that women headed households are at

an extreme disadvantage economically in relation to male headed households.

Another indicator of general economic well being is the number of poverty households within any given group. It is not too surprising that there is much more poverty among families headed by a woman than male headed families. In 1970, only 8.2 percent of male headed families were under the poverty level, as compared with a startling 38.2 percent of all female headed households.

Table 2 provides another view of income and poverty status by racial identification. Some of these results are surprising, especially the relative position of some Oriental families. Japanese-Americans in the San Francisco-Oakland SMSA are above the median income. In addition, only 5.4 percent of all Japanese-American families were below the poverty level in 1969. This is testimony to the rapid economic progress Japanese-Americans have made in the last two decades. Chinese and Filipinos show somewhat lower median family incomes and higher levels of poverty than the Japanese. Of the minority groups, blacks have the lowest incomes and a much higher incidence of poverty households.

Table 2

Selected Statistics on Income in 1969 by Race

Race	Median Family Income	Percent Poverty Level
All Families	$11,956	7.2%
Negro	7,966	20.1
Spanish Surname	10,459	9.3
Oriental		
Japanese	12,045	5.4
Chinese	10,593	10.6
Filipino	10,122	11.8

Source: 1970 Census of Population.

Perhaps a prima facie case can be made, without exhaustive evidence, that the poor (those households around the poverty level) are both generally and transportationally disadvantaged. For 1971 the low income (poverty) level for a family of four was set at $4,139. It is certainly difficult to imagine a family obtaining much mobility, via automobile or public transit, at that low level. The concept of income can be put into better perspective by considering the 1971 prototypical family budgets compiled by the Bureau of Labor Statistics shown in Table 3.

Table 3

Budgets for a Four-Person Family in a Metropolitan Area, 1971

	Lower Budget	Intermediate Budget	Higher Budget
Cost of consumption total	$5,926	$ 8,823	$12,282
Food	1,996	2,575	3,274
Housing	1,543	2,723	4,137
Transportation	512	969	1,273
Clothing and personal	862	1,214	1,765
Medical care	630	633	659
Other family consumption	383	709	1,129
Other costs	359	567	955
Social Security and disability	395	421	421
Personal income taxes	651	1,121	2,751
Total family income	7,330	11,232	16,408
Transportation costs as a percentage of total family income	6.98%	8.62%	7.75%

Source: U.S. Department of Commerce, Statistical Abstract of the United States 1973, p. 356.

The BLS estimate of a lower level of consumption is 56 percent higher than the poverty threshold. For the lower budget the annual amount for transportation for the family is only $1.41 per day. This hardly seems sufficient to operate an automobile. A family near the poverty level would have even less to spend on transportation.

Without belaboring the point, which is very intuitive, households at the poverty level can be considered to be both generally and transportationally disadvantaged. This includes poor whites as well. Poor minorities face additional problems because of racial discrimination which compounds already severe problems of poverty. The handicapped who are at the poverty level are severely disadvantaged by their dependency and the lack of financial means to alleviate their condition. Similarly, the poor elderly, regardless of race or infirmity, can be considered disadvantaged for reasons which have already been stated. The same applies to women and children who are in poverty households.

When we move up the income distribution, and away from the poverty households, the concept of disadvantage is not nearly as clear cut. First let us define moderate income as the household above the poverty level, but not really above the median income. This would likely be a family of four with an income in the range of $11,000 to $12,000 at 1970 prices and about $13,000 to $14,000 in 1975 dollars. Now we must ask the elemental question: does a moderate income in any way cause, or seriously contribute to, the relative disadvantage of any individual or group? Or conversely can a person of moderate income be considered disadvantaged?

Reference to Table 3 shows that the moderate income family could pay $969 a year for transportation. This is probably enough for the

maintenance of an automobile. However, it is certainly not a lot of money for a family to spend on transportation. It is probably sufficient if the mobility demands of the family are modest; if public transportation is available; if the place of work is not far; if a reasonably reliable used car can be had. It would be difficult to make the prima facie case that this family is transportation disadvantaged, at least by its income.

A persuasive case can probably not be made that moderate income whites who are neither handicapped nor elderly belong to any disadvantaged group. But we cannot automatically rule out the possibility that some moderate income whites will be considered disadvantaged in a transportation context. It is possible to conceive of an imbalance between place of work and place of residence that would make a moderate income white family disadvantaged in a transportation context.

Can a persuasive case be made that moderate income minorities are disadvantaged? Here again there is no clear cut answer. Disadvantaged in what sense? Disadvantaged in relation to what? The best answer is probably a weak "maybe" which acknowledges latent discrimination. But in terms of transportation does moderate income among minorities, the elderly, handicapped or women confer any specific disadvantage? The answer is probably "no." All persons of moderate income can probably afford transit fares and afford automobiles. With the exception of the handicapped, moderate income families as an entity are not ipso facto disadvantaged in any transportation context. It apparently takes other factors than race, age, and sex per se for a moderate income household to be transportation disadvantaged.

The last category in Table 3 is for the higher budget for an income

of $16,000 in 1971 and $19,000 in 1975. There are some social disadvantages experienced by middle class minorities in spite of relatively high incomes. The degree of this disadvantage is difficult to determine and will not be attempted here. Even accepting this at face value, it is still very difficult to ascribe any particular transportation disadvantage to groups or individuals who have incomes that are well above the median. A possible exception is the severely handicapped person.

Mobility Problems of the Handicapped

Equal access to all facilities has become a civil rights issue. Disabled persons have demanded equal access as a Constitutionally guaranteed right of equal protection and due process. What is sought is access to all buildings and all facilities, an exercise of the right to travel. Anything less is viewed as a serious infringement of Constitutional rights. No doubt this thrust from handicapped people is influenced by other disadvantaged groups who have been demanding equality.

For the handicapped, lack of access precludes many opportunities for education, employment, health care, and adequate housing and recreation. To avail oneself of most opportunities usually requires personal mobility. But it must be pointed out that transportation will not in itself cure all of the problems of the disabled. However, it is usually a necessary first step.

For the handicapped there are various public and private programs for vocational rehabilitation. To the degree that these programs are successful, they will in turn stimulate increased demand by the handi-

capped for access to the transportation system. There is of course no demand for transportation by the handicapped who are shut-ins or recluse because of lack of ability to earn a livelihood. When such a person obtains skills and confidence, the person will seek to become more mobile. As Zukas[3] (1974) has stated, persons who have been confined since childhood may have no idea of how their lives and aspirations may change with increased mobility.

There are myriad physical and psychological disabilities which impair an individual's ability to function. However, at some point disabilities can cause an acutal handicap to the person. The distinction between disability and handicap is made by Ridge (1972).[4]

> Disability exists when an impairment causes a limitation on an individual's capacity to function, such as the inability to walk or write or lift. Note that the degree of disability may depend not only on the nature of the impairment, but his reaction to the situation. A handicap arises when the disability imposes limitations on an individual's ability to carry on his or her usual activities, such as to perform on the job, or to play with other children, or to care for his/her own personal needs.

Various disabilities will of themselves cause transportation handicaps, since they may impede the individual's ability to use the range of transportation options available to the able bodied. In addition to limiting the range of transportation options (many disabled persons cannot drive automobiles), the use of alternatives may be diminished. The handicap which prevents an individual driving his own car may also prevent the person from using public transit, if for instance the person is confined to a wheelchair.

The determination of just when a disability becomes a serious transportation handicap is of immediate concern to transit operators and trans-

portation planners since UMTA has required that all transportation facilities be accessible to all persons, regardless of physical condition. Additionally, UMTA has decreed that handicapped receive low fares. In an attempt to comply with UMTA regulations, transit operators have developed criteria for determining eligibility for discount fares for the handicapped.[5]

> A transportation handicap is any incapacity or disability which results in the inability of a person to perform one or more of the following functions necessary for the effective use of mass transportation facilities without significant difficulty:*
>
> 1. Negotiating a flight of stairs, escalator or ramp;
> 2. Boarding or alighting from a standard bus, streetcar, cable car, muni metro-cars, train or ferry;
> 3. Standing in a moving bus or train;
> 4. Reading informational signs;
> 5. Hearing announcements by transit vehicle operators;
> 6. Walking more than two hundred (200) feet.

The kinds of physical disabilities which handicap persons using the transportation system can be put into four broad categories determined by the kind of disability:

1. Non-ambulatory disability; an impairment which confines an individual to a wheelchair.

---

*Exclusions to the criteria are:

Persons whose sole incapacity is:

1. Any physical, mental or psychological disability or incapacity of less than six (6) months duration;
2. Pregnancy;
3. Obesity;
4. Acute or chronic alcoholism or drug addiction;
5. Contagious diseases;

are specifically excluded from discount fare eligibility.

2. Semi-ambulatory disability; the kind of disability which requires the use of mobility aids such as leg braces, crutches, etc.

3. Functional disabilities; which limit the amount of physical activity that the person can engage in, such as cardiac and kidney diseases.

4. Sight and hearing disabilities; includes the legally blind and those with acute tunnel vision and those whose hearing will not allow them to hear warning signals.

5. Developmental disabilities; such as mental retardation, cerebral palsy, epilepsy, autism, and other such neurological disorders.

In the case of the severely handicapped there are often multiple problems. In addition to the physical handicap itself, there is often advanced age, low income, lack of specific skills, lack of education and mental and emotional instability. Thus many times even an improvement in the individual's mobility, through the use of therapy, aids, training, etc., may not be enough to materially affect the well being of the person.

How Numerous are the Handicapped?

There are conflicting statistics on just how many persons are disabled or handicapped. Some of the conflict arises from the fact that there is no uniform definition as to just who is or is not a disabled person. Perhaps the most comprehensive study of the disabled population was done by the Social Security Administration in a 1966 study, Survey of the Disabled.[6] Recent statistics have been compiled by the Bureau of the Census, who in 1970 asked three questions dealing with occupational disabilities.[7] According to the Social Security

Administration (updating the 1966 data) in 1970 there were 11.8 million disabled persons, of which 6.7 million had disabilities which prevented them from working. This is compared with the 1970 Census figures that 12 million persons were disabled (hindered occupationally) and that 5 million were so precluded from working. It would appear that the two studies are roughly comparable.

To obtain some idea of the magnitude of the number of persons who might be considered transportationally handicapped, in terms of reduced mobility, Tables 4 and 5 provide current estimates of the transportationally handicapped.

Table 4

Number of Handicapped Persons with Chronic Mobility Limitations By Age Category United States, 1975

Degree of Limitations	Under age 17	17-64	65 and over	Totals
Has trouble, but gets around alone	74,000	1,413,000	1,174,000	2,661,000
Needs help in getting around:				
Special aid	40,000	493,000	1,001,000	1,532,000
Another person	45,000	186,000	353,000	583,000
Confined to home:				
Not confined to bed	30,000	522,000	803,000	1,355,000
Confined to bed	9,000	202,000	246,000	457,000
Institutionalized	N/A	N/A	1,021,000	1,049,000
TOTALS	198,000*	2,815,000*	4,597,000	7,636,000

*Does not include institutionalized.

Sources: Transportation Systems Center (TSC), The Handicapped and Elderly Market for Urban Mass Transit, prepared for the Urban Mass Transportation Administration, October 1973; U.S. Department of HEW, National Center for Health Statistics, Limitations of Activity and Mobility Due to Chronic Conditions, United States - 1972, Series 10, No. 96, November 1974; estimates for 1975 derived from using U.S. Bureau of Census, Population Estimates and Projections, Series P-25, No. 493, December 1972; fertility assumptions from Series F.

Table 5

Number of Non-Institutionalized Handicapped Persons with Chronic Mobility Limitations by Selected Mobility Aids
United States, 1975

Mobility Aid	Under Age 65	65 and over	Totals
Cane	460,000	1,910,000	2,370,000
Crutches	261,000	147,000	408,000
Walker	26,000	381,000	407,000
Manual Wheelchair	139,000	248,000	387,000
Power Wheelchair*	37,000	--	37,000
Leg or Foot Brace	194,000	53,000	247,000
Artificial Leg or Foot	113,000	13,000	126,000
TOTALS	1,230,000	2,752,000	3,981,000

*The split between manual and power wheelchairs is based on the FY74 production ratio of Everett & Jennings, Inc., the largest manufacturer of wheelchairs in the U.S. (approximately 70 percent of the market). Power wheelchairs are purchased almost exclusively by persons between the ages of 18 and 50.

Sources: U.S. Department of Health, Education and Welfare, National Center for Health Statistics, Use of Special Aids, United States - 1969, Series 10, No. 78, December 1972; plus sources listed for Table 4. Non-reported conditions were attributed proportionately to chronic and acute conditions; for wheelchairs and walkers the chronic-acute use ratio for crutches was used. The use of each aid by those persons under age 65 with acute conditions was assumed to be proportional to the total number of persons under age 65 with acute conditions. Compiled by Berkeley Planning Associates, 1975.

How Relevant is a Census of Handicapped?

It is important to consider just how relevant (or for that matter how irrelevant) a census of handicapped really is. Any census will only give the number of disabled/handicapped at a point in time. Thus, Tables 4 and 5 may be a proper starting point for further analysis.

However, a key point is that the handicapped/disabled population is far from static, and is related to other important changes occurring in society.

Life expectancy is increasing, so that the average person has a life expectancy now of greater than 70 years. Such an increase in longevity no doubt has many reasons, but of importance are advances which have been made in medical science. We should consider the fact that antibiotic drugs were first used in 1938, scarcely 37 years ago. One corrolary to increased longevity, and one that is most often overlooked, is that greater life expectancy gives each individual a greater statistical chance to be disabled in some form for some period of his or her life.

Another factor to consider is that many persons who are confined today may not be confined in the future as the technology of providing individuals with mobility improves. Witness the astonishing effects brought about by the electrically powered wheelchair which can be controlled electronically.

Another point to remember is that almost one half of the elderly population (over 65) has some kind of disability which limits mobility. With increased longevity there will undoubtedly be many more elderly persons with some mobility impairments.

Barriers to Mobility

The handicapped confront numerous barriers to their mobility, which can be defined as all of the physical and institutional impediments to their movement between places. The barriers can be placed into four main categories:

1. Physical barriers; such as walking distances which are excessively arduous for the semi-ambulatory, inadequate spaces for the accommodation of wheelchairs, and general lack of support services such as specially designed and fitted vehicles.

2. Operational barriers; problems caused by such things as traffic signals which are of insufficient duration for the disabled, and sudden acceleration of transit vehicles.

3. Psychological barriers; many handicapped experience anxiety around crowds and strangers. There is often a lack of confidence in using public facilities, because they may need (or others may think they need) assistance.

4. Economic barriers; frequently the handicapped are poor or unable to develop their full economic potential because of their inability to obtain suitable employment, which sometimes is the result of a lack of mobility within the existing transportation system.

The non-ambulatory wheelchair disabled clearly face numerous societal and transportation barriers. Most all of the man made environment is designed for persons with the full use of limbs. Entering buildings, using lavatories, eating a meal, attending a lecture or concert, shopping and many other activities are often extremely difficult or impossible for the wheelchair confined person. Not only is lack of mobility a barrier, but even if the person can transport himself the built environment frequently will be inaccessible to the wheelchair. Such individuals are both socially and transportationally disadvantaged. In this case, income may not be sufficient to overcome this form of disadvantage. A person may be well off financially, but be disadvantaged in a mobility sense if the person is non-ambulatory.

The blind are another category of disabled who face both general societal and transportation disadvantages. It is probably true that stigma still attaches to being blind. Some employment opportunities are difficult to obtain if one is blind, although the person may be qualified. The blind person who is ambulatory without special mechanical assistance still faces burdens in achieving total mobility. Thus the blind as a group should be considered a generally disadvantaged group in terms of both social opportunities and in terms of transportation.

The third category of disabled are those who are semi-ambulatory with mobility aids such as crutches, braces and canes. Although many of these persons travel only with great difficulty, they are mobile and fairly self sufficient, although they may need some personal assistance with the high steps on buses and getting across curbs. The distance they may be able to travel to a transit stop may be limited. Here there is probably both general societal disadvantage and special transportation disadvantage. Some social stigma still attaches to those who are crippled. The special problems of barriers, both real and psychological, impede their mobility. For these reasons those disabled who are semi-ambulatory needing special mobility aids should be considered disadvantaged.

A fourth category of transportation disabled are those with functional disabilities such as heart conditions which limit the amount of physical activity that can safely be done. In this category are those who are disabled but who are usually ambulatory, not requiring mobility aids such as crutches, braces or wheelchairs. This covers a wide range of disabilities such as persons

with heart conditions, arthritis, kidney disease and other such ailments. Such persons may hold jobs and function in a relatively normal manner and not be readily identifiable as handicapped. In looking at this wide group of individuals the first question is, does their condition cause a general societal disadvantage? And here again there is no clear answer. There may be stigmas attached to certain of the aforementioned disabilities, but it would be difficult to classify.

A fifth classification are those with developmental disabilities which may range from mental retardation, to cerebral palsy, to autism. In such cases a whole host of disabilities is likely to be present and no simple description of their mobility difficulties is possible. The midly retarded may have little difficulty using the transportation system. However the transportation system is complicated and mechanized and may be beyond the capacity of the severely retarded. Perhaps the only generalization that can be made about those with developmental disabilities is that their transportation disadvantage is apt to be mild if their disability is mild and severe if their disability is severe.

A last category of the disabled are those who are institutionalized with severe disabilities. Reasons for institutionalization may vary from severe mental retardation to physical paralysis. Regardless of race or income status, this is by almost any definition a severely disadvantaged group. However because of the severity of the kinds of disabilities which require institutionalization, the idea of transportation disadvantage for this group may be moot. This consideration is important in

trying to determine the relevancy of the term transportation disadvantage. In order for the concept of transportation disadvantage to have any meaning there must be at least latent opportunities for the individual to exercise mobility. To a person confined indoors by nature of a severe disability, the concept of transportation disadvantage may not be a meaningful one.

Place of Residence and Place of Employment

Residential location proffers two attributes to the resident: accessibility and status. We will now turn to these two concepts and try to correlate them with transportation sufficiency and transportation disadvantage.

General accessibility can be defined as the ease with which the person can travel to a mix of urban activities such as employment, shopping, schools, recreation opportunities and other such places. Location within the central cities traditionally offered the best advantage in terms of general accessibility to most urban activities. The Post WWII highway improvements have made the suburbs, at least those that are close-in, much more accessible to the activities which are concentrated in central cities, such as education, specialty shopping and health services. However the suburbanization of many urban functions, especially employment centers such as industrial and office parks, and shopping centers, have made the close-in suburbs much more accessible places. In fact, some close-in suburbs may be more accessible than many central city neighborhoods in terms of quickly reaching centers for shopping, employment and recreation. From suburban San Mateo County a person can easily get to downtown San Francisco, as well as other points

in San Francisco, plus have easy access to suburban shopping centers and places of interest.

While it may be true that in general residents of central cities have greater accessibility to urban places and functions, many close-in suburban locations also enjoy comparable advantages. This situation has occurred over the last two decades with the urban highways, and in some places like the San Francisco SMSA, by rapid transit improvements.

Another important concept is that of specific accessibility, or the ease of travel to a particular place of activity. For instance, a house may be located far from the center of general activities, but adjacent to a particular factory, school or park. This specific accessibility may be highly valued and may offset the lack of general accessibility of the location. It is very important to keep this distinction in mind when passing judgment on many outlying locations that ostensibly appear to have low accessibility. Even though a residence may be far away from most urban acitivty it may be well situated to some specific feature that is valued by the occupants. This is one of the reasons that value judgments about relative accessibility have to be restrained.

Status is another important attribute of location since the neighborhood qualities are often bestowed upon the residents. It is known that people will pay a premium to occupy housing in high status neighborhoods or suburbs, and will avoid those locations with low status values.

The very place of residence may confer certain disadvantages upon individuals. For instance the pathology of the ghetto/barrio in central cities is in itself often debilitating. High crime, poor schools and general anomie which is often apparent create a depressed environment,

which is often difficult for the individual to rise above. Within the worst sections of the ghetto/barrio the quality of life may be sufficiently low to confer serious disadvantages on all but the most hardy of its residents. And this of itself can be a sufficient reason to label the residents disadvantaged.

Within the array of generic kinds of urban neighborhoods the ghetto/barrio has the lowest status. It is within the ghetto/barrio that the lowest incomes, highest crime rates, highest mortality rates, highest welfare dependency rates and other such indicators of poverty and despair are found. The conditions of the ghetto/barrio have been well documented in many studies and need not be dwelled upon here. It is probably sufficient to say that within the ghetto/barrio are virulent conditions which contribute to the disadvantaging of many of its residents.

However, the traditional ghetto/barrios are usually centrally located. Within almost any central city the area of concentrated low income and/or minority households is close to the downtown. Even when ghetto concentrations are found some distance away from the downtown area, they are usually astride major streets and transit lines. From this kind of observation it would appear that the ghetto/barrios are well situated in terms of general accessibility: close to downtown and on the main traffic arteries and transit lines.

Is it enough to say that since the ghetto/barrio is well served in terms of number of busses, trolleys and trains running <u>through</u> it, that its residents are not transit disadvantaged? Since many of the ghetto/barrio residents are poor and welfare dependent, their poverty makes them disadvantaged in almost every context. Most of the residents will also be members of deprived minority groups. Many of the residents will

be elderly and female household heads and face multiple disadvantages because of these attributes. Thus a picture quickly emerges that many of the ghetto/barrio residents are disadvantaged because of their income and social status. It will be true that many of the residents that fall under a rubric "disadvantaged" also have transportation disadvantages because of low income, infirmity, age and sex.

Still, a recitation of the numerous disadvantages imposed upon ghetto/barrio residents begs the question as to whether the ghetto is of itself a source of transportation disadvantage. If transportation sufficiency refers to access to frequent service then the ghetto/barrio does not automatically qualify as disadvantaged. As an example, data on transit availability by race is given in Table 6, which shows that central city minority residents are better situated with better service than whites in terms of travel times and headways and distance to transit stops.

Table 6

Distance to Nearest Public Transportation to the CBD by Race (1969-1970)

	Distance to public transportation - blocks				
	Less than 1	1 - 2	3 - 6	Over six blocks	None available
Race:					
White	20.2	29.4	18.7	18.1	13.3
Negro and other races	29.4	40.6	18.0	6.0	6.0
Total	21.3	30.8	18.6	16.6	12.4

Source: United States Department of Transportation, Federal Highway Administration, Nationwide Personal Transportation Study, Report No. 5, "Availability of Public Transportation and Shopping Characteristics of SMSA Households," July, 1972, Table 2.

In spite of the kind of evidence which is presented in Table 6, a common negative response is that the transit lines merely go through minority communities, and do not serve them adequately. Some complaints are: that service may be different in other parts of the city; that better equipment (air conditioned buses) is used in white areas; that many aspects of the transit service are in fact discriminatory. These kinds of allegations and suspicions are very difficult to either prove or disprove. Proving or disproving these kinds of allegations is not the purpose here.[8]

Transportation arteries (highways, rapid transit tracks, etc.) that pass through the central city minority communities have been described by Duster (1975) as "mechanistic intrusions" which are the makings of the white world.[9] As such the transportation system provides many harsh psychological symbols of the majority forcing its will on minorities for its own convenience. There are examples in large metropolitan regions of transit lines and highways that pass through minority neighborhoods to convey commuters from outlying areas into downtown. Of course, this situation will vary with the community. In Chicago, for instance, the rapid transit lines which go through the black communites are also heavily utilized by blacks. The same can be said of the New York City rapid transit lines, which have traditionally been heavily utilized by the city's poor and minorities. On the other hand, BART, which passes through some heavily minority communites, does not seem to be utilized in any great degree by the minority residents. In this sense it may have some resemblance to a kind of "mechanistic intrusion."

The important question which arises from this discussion is whether or not the place of residence affects or influences the concept

of transportation disadvantage. And here again we must try and distinguish between general societal disadvantage and transportation disadvantage. Living in the ghetto/barrio may disadvantage a person in terms of total development. But does living in a ghetto/barrio in the central city disadvantage a person in any transportation sense? The question can be posed at the other end of the spectrum. Does living in the high status suburb, which tends to confer general social advantage on a person, make the person advantaged in any transportation sense? It probably does not. These cases, the ghetto/barrio and high status suburb, may not be entirely symmetrical. But it would be hard to say that on the basis of accessibility indicators (of whatever sort used) that the ghetto/barrio as a place of residence places a particular transportation disadvantage upon an individual. It may place other disadvantages, to be sure, but not transportation per se.

Central cities are much more than ghettos/barrios. Central city neighborhoods run the gamut from high status suburban type areas to declining gray areas. Once outside the ghetto/barrio it is very difficult to make a sufficient case that central city residents are disadvantaged in a transportation sense merely by location. Even in central cities which do not have good public transportation, that service is usually much better than the kind of transit found in its suburbs.

It is likely that some suburban areas may qualify as transportation disadvantaged by excessive distances between activity centers and lack of public transit. This is probably more acute in the outlying suburban fringe rather than the close-in suburbs. But in this case we are prefacing any alleged disadvantages on apparent lack of services, as compared with central city neighborhoods where services abound. Suburban

poor families, or those without access to automobiles, can probably be considered disadvantaged in this context. However, in this case as with central city locations it is not the place of residence per se that causes the disadvantage. The lack of intensive public transit and the spread character of the suburb may serve to make an already deficient situation worse, as is the case with the poor.

The handicapped may face more severe transportation problems with suburban residence than do other persons. The average suburban resident who is not poor has no severe mobility problem. Most suburban families have at least one automobile. Data from the 1970 Census shows that almost half of the families of moderate income have two automobiles per family. In spite of the fact that public transit is not available in many suburban communities, the average resident has no transportation disadvantage because he/she probably has an automobile available. But the handicapped person in suburbia who cannot drive a car, or who does not have access to someone who will drive, may face severe mobility problems. Another source of disadvantage for the suburban disabled person is the fact that many medical and support facilities are still concentrated in cities. Thus the handicapped person may have an arduous journey into the city for various support activities.

The Journey to Work

Let us now turn to jointly consider the place of residence, place of employment and mode of transportation. The 1970 Census contained detailed breakdowns of employment, residence and transportation by race and sex. Some of these data for the San Francisco-Oakland SMSA are reproduced in Tables 7 through 9. An examination of these data are

Table 7

Selected Labor Force Characteristics by Place of Residence and Place of Employment

		Residence in Central Cities Place of Employment				Residence Outside Central City Place of Employment				Total Workforce Place of Employ.			Total
		CBD	ECC*	Suburbs	Total	CBD	ECC*	Suburbs	Total	CBD	ECC*	Suburbs	
All males over 16	%	6	18	10	34	5	13	48	66	11	31	58	
	Earnings	10190	8130	7968	8446	14761	11374	9758	10455	12268	9490	9449	9774
Negro males over 16	%	6	34	27	67	1	7	25	33	7	41	52	
	Earnings	6557	6666	5708	6544	8167	8243	6587	6986	6787	6935	6131	6691
Spanish Surname males over 16	%	6	21	10	37	4	14	45	63	10	35	55	
	Earnings	7580	7220	7459	7343	11931	9703	8297	8840	9320	8213	8145	8290
All females over 16	%	11	22	8	41	4	9	46	59	15	31	54	
	Earnings	5206	4723	4648	4838	5612	5524	4421	4670	5314	4956	4455	4738

*ECC - Elsewhere Central City

Source: 1970 Census of Population and Housing.

Table 8

Selected Labor Force Characteristics by Place of Residence, Place of Employment, and Mode of Transportation

		Residence in Central Cities Place of Employment				Residence Outside Central Cities Place of Employment				Total Workforce Place of Employ.			Total
		CBD	ECC*	Suburbs	Total	CBD	ECC*	Suburbs	Total	CBD	ECC*	Suburbs	
All males over 16													
Auto Drivers	%	3	16	9	28	4	15	53	72	7	31	62	72
	Earnings	13128	9204	8724	9476	15748	11596	10243	10831	14625	10361	10023	10451
Auto Passengers	%	4	16	12	32	7	14	47	68	11	30	59	7
	Earnings	10132	7464	7345	7753	13665	9836	9854	9123	12380	8571	9344	8689
Public Trans.	%	25	28	12	64	16	9	11	36	40	37	23	11
	Earnings	8452	6267	5609	7095	13434	10550	6800	10686	10656	7309	6179	8375
Other Means	%	9	26	9	44	2	5	49	56	11	31	58	10
	Earnings	7726	5983	5897	6322	14263	10759	7399	7945	8915	6753	7166	7234
All females over 16													
Auto Drivers	%	3	14	7	24	2	10	64	76	5	24	71	53
	Earnings	6389	5785	5307	5721	6241	5838	4836	5005	6330	5807	4882	5183
Auto Passengers	%	8	19	7	35	8	12	45	65	16	32	52	13
	Earnings	5475	4916	4899	4900	5525	5306	3925	4377	5500	4909	4056	4569
Public Trans.	%	31	33	12	76	9	6	9	24	40	39	21	23
	Earnings	4978	4277	4100	4535	5247	4726	3469	4502	5039	4346	3829	4527
Other Means	%	10	35	7	52	0	1	47	48	10	36	54	11
	Earnings	4853	3350	3706	3687	5890	3588	2853	2869	4853	3157	2963	3291

*ECC - Elsewhere Central City

Source: 1970 Census of Population and Housing.

Table 9

Selected Labor Force Characteristics by Place of Residence, Place of Employment, and Mode of Transportation

		Residence in Central Cities Place of Employment				Residence Outside Central Cities Place of Employment				Total Workforce Place of Employ.			Total
		CBD	ECC*	Suburbs	Total	CBD	ECC*	Suburbs	Total	CBD	ECC*	Suburbs	
Negro males 16 and over													
Auto Drivers	%	4	33	27	64	1	8	27	36	5	41	54	70
	Earnings	7597	7369	2809	7147	8471	8512	7134	7477	7772	7592	6972	7267
Auto Passengers	%	4	30	32	66	1	7	26	34	5	37	58	8
	Earnings	7925	6163	5712	6413	--	7942	6102	6302	7925	6499	5887	6374
Public Transp.	%	18	38	28	84	3	3	10	16	21	41	38	15
	Earnings	5536	4964	4938	5078	7140	5592	4302	5076	5765	5010	4771	5077
Other Means	%	5	39	17	61	0	3	36	39	5	42	53	7
	Earnings	4055	4661	5248	4775	--	8035	4566	4833	4055	4902	4785	4661
Spanish Surname males 16 and over													
Auto Drivers	%	3	18	10	31	3	16	50	69	6	34	60	73
	Earnings	9163	8068	7999	8152	12528	9960	8753	9197	10846	8958	8627	8876
Auto Passengers	%	4	16	11	31	5	12	52	69	9	28	63	7
	Earnings	7424	6166	7414	6771	9312	8567	6460	7033	8473	7195	6627	6952
Public Transp.	%	26	37	12	75	8	9	8	25	34	46	20	12
	Earnings	6372	5632	5616	5886	10783	7859	5607	8074	7410	6068	5612	6437
Other Means	%	7	28	8	43	2	5	50	57	9	33	58	8
	Earnings	7536	5697	5953	6044	--	9101	7114	7288	7536	6213	6954	6759

*ECC - Elsewhere Central City

Source: 1970 Census of Population and Housing.

quite instructive in resolving just who seems to face disadvantage in terms of these variables. Consider first the evidence of Table 7 which categorizes much of the work force of the San Francisco-Oakland SMSA by residence, income and place of employment. For the male labor force over 16 one third lived in central cities and two thirds lived in the suburbs. However, those finding are reversed for blacks, with the majority residing in the central cities. Although most black males live in the central cities, most black employment is outside the central city. Little black male employment is in the central business district, only 7 percent.

A look at the mean earnings in Table 7 is also instructive. It appears that the highest earning group is the suburban male resident who works in the central business district. Among males the lowest paid is the black central city worker who commutes outside the central city. Females in the labor force have much lower earnings than males across each place of residence.

Tables 8 and 9 take the data a step further by analyzing the workers by mode of transportation as well as income, residence and place of employment. From Table 7 it can be seen that auto drivers are both the most numerous and highest paid of all workers, for both males and females. Generally the lowest incomes are for those who live in central cities and take public transportation to work. The reverse commuter has the lowest mean earnings.

Table 9 shows the same data for Negro and Spanish Surname males over 16. The statistics for Spanish Surname are not very different from the totals for all males over 16 in the SMSA. The incomes are slightly lower, but most of the patterns remain the same. There are some differences

between blacks over 16 and the area totals.

Table 9 is interesting in terms of the empirical support it does or does not lend to the mis-match hypothesis, that the jobs are in the suburbs and the needy potential labor force is in the central city. The usual remedy offered is to get the poor from the central cities out to the jobs somehow. This accepts the somewhat dubious proposition that minority inner city residents are unable to get out to the suburban jobs.

Some studies have tended to bear out the observation that poor minorities in central cities may find suburban jobs inaccessible. Of course, for this to be true, that poor inner city minority residents cannot get to the suburban jobs, many more forces have to be at work. Just the proposition that the jobs are too far, or that bus service is too expensive or unreliable, is not enough to explain central city unemployment. The so-called "mis-match" hypothesis, that the jobs are in the suburbs and those needing the jobs are in the central city, does not hold up to careful scrutiny. And it also does not reconcile well with the kinds of evidence one encounters at the morning and evening rush hours, where various minorities seem well represented (in their autos) going to and from their outlying jobs.

Perhaps one grain of truth in the so-called "mis-match" hypothesis is that the initial barrier of having no automobile may cause some inner city residents to refrain from looking for jobs in outlying locations. However, experience has shown that when such jobs are obtained in outlying areas that the person quickly obtains an automobile and abandons public transit.

Job location may be one of the factors that contributes to transportation disadvantage among various individuals. Yet a strong case cannot

be made that it is a significant factor. Like so many other factors that we have discussed thus far, it in tandem with other forces or other characteristics may lead to a relative disadvantage.

Table 9 certainly does not support the mis-match hypothesis. It shows that more than half the black males in the labor force already are reverse commuting from the central city out to suburban jobs. It also shows, across the board, that the highest paying jobs, for all workers, are in central cities.

Automobile Accessibility

Adults today without direct access to an automobile have their mobility impaired, and some may be transportation disadvantaged. Since an automobile is expensive, it is no surprise that the likelihood of not having access to an automobile increases inversely with income. Since income is also related to race, minorities on a per capita basis have less access to a personal automobile.

Table 10

Percentage of Household Members Without Direct Access to an Automobile, by Race

Total All Households	31%
Majority White	26
All Minorities	47
Spanish Surname	36
Black	43
Oriental	73
Other	47

Source: D. L. Foley, Differentials in Personal Access to Household Motor Vehicles: Five County San Francisco Bay Area, 1971. Working Paper No. 197/BART 9, December 1972, Institute of Urban and Regional Development, University of California, Berkeley.

Race and income are not the only factors affecting automobile ownership. The place of residence is also important. Those who live in the central cities, especially in dense core areas, will have a lower auto ownership rate. Witness the Oriental rate, which is related less to the low income but to the very dense location in places like Chinatown, where auto storage is an acute and expensive problem.

In the San Francisco-Oakland SMSA the automobile is by far the most common mode of transportation to work. More than 70 percent of the daily work trips are taken by auto as can be seen in Table 11. However, there are some similarities and differences along racial lines when comparing Chinatown and certain selected census tracts in Oakland, where the black population was more than 90 percent of the total.

The mode of transportation to work is not very different between the selected black census tracts in Oakland from the total SMSA. However, the characteristics of Chinatown residents is in stark contrast. More than half of the Chinatown residents walked to work, as compared with the average of the SMSA of only 6 percent. In Chinatown only 11 percent of the residents used automobiles to get to work as compared with 74 percent for the SMSA. The income statistics do not provide evidence that family income would be much of a factor in explaining this modal choice of Chinatown residents since the median income of Chinese-Americans is not that much lower than that for the average of the SMSA. Also the median income for Chinese-Americans is higher than it is for blacks, yet blacks utilize private autos for almost the same percentage of work trips as the average for the SMSA.

One explanatory factor for the Chinatown population low use of automobiles is the fact that a large portion of the workforce is employed

Table 11

Method of Transportation to Work and Place of Work by Race for the San Francisco-Oakland SMSA (core tracts), and Selected Black Census Tracts in Oakland

Mode of Transportation	SMSA	Chinatown	Oakland (Black)
All workers	1,262,673	3,847	
Automobile drivers	65%	8%	62%
Automobile passengers	9	3	12
Bus or streetcar	14	28	16
Subway or train	1	-	-
Walked	6	57	5
Worked at home	3	2	3
Other means	3	1	2
	100	100	100
Place of Employment			
San Francisco CBD	13%	32%	3%
San Francisco elsewhere	24	62	5
Oakland CBD	2	-	4
Oakland elsewhere	11	1	53
Alameda County	20	1	32
San Mateo County	14	4	-
Contra Costa County	12	-	1
Marin County	4	1	-

Source: 1970 Census of Population and Housing.

in downtown San Francisco, which is within walking distance of Chinatown.

Who Is Transportation Disadvantaged?

From the previous analysis of the probable factors which cause both general societal and transportation disadvantages some picture does emerge.

In order to focus upon these images and provide an intellectual handle on the disadvantaged, and especially the transportation disadvantaged,

matrices of social and economic characteristics have been arrayed by types of persons and are shown as Tables 12 and 13. Table 12 summarizes the foregoing analysis of the severity of general disadvantages persons are subjected to because of race, age, sex and general socio-economic characteristics. Table 13 uses the same measures but with a different emphasis: to determine relative transportation disadvantage. The two, general societal disadvantage and transportation disadvantage, are not the same. But comparing the two tables will enable us to look at the degree of overlap between the two.

Three symbols are used in the matrices: an X where there seems to be clear evidence that the characteristic causes disadvantage; a dot (·) where there may be some causality and a question mark (?) where there is some doubt. The blank cells are those characteristics which do not seem on their face, or on the basis of evidence, to bear on disadvantage. If we are to speak of the transportation disadvantaged, keeping this concept separate from general societal disadvantage, then the transportation disadvantaged are certainly the poor and the seriously disabled. Referring to Tables 12 and 13 shows that clearly those at the poverty level are both disadvantaged by society in general and also have special mobility disadvantages. The severely disabled also face similar situations. But once we move away from these two groups it is difficult to find unique characteristics which make a particular group transportation disadvantaged.

Racial minorities are not automatically transportation disadvantaged, even though they may face severe status problems. A case of transportation disadvantage cannot be made solely on the evidence of ethnicity. Even residence in a ghetto/bario cannot qualify one for status as transportation disadvantaged. In fact it is through the ghetto/barrio that many of the

Table 12

Matrix of Societal Disadvantages by Transportation Characteristics

Characteristics	Majority White Male	Majority White Female	Minority Male	Minority Female	Handicapped	Elderly	Youth
Income							
Poverty Level	X	X	X	X	X	X	X
Moderate			.	.	.	.	.
Above Median			?	?	?	?	?
Physical Condition							
No impairments							
Ambulatory, but requiring mobility aids	?	?	?	?	?	?	?
Wheelchair	X	X	X	X	X	X	X
Institutionalized	X	X	X	X	X	X	X
Place of Residence							
Central City - Ghetto/Barrio			X	X	X	X	X
Central City - Other			?	?			
Suburb - Close in							
Suburb - Fringe and Rural							
Place of Employment							
Downtown							
Central City - Other							
Suburb - Close in							
Suburb - Frige and Rural							
Auto Accessibility							
Auto Available							
Auto Not Available	?	?	?	?	?	?	?
Dependency							

Table 13

Characteristics of the Transportation Disadvantaged by Selected Transportation Characteristics

Characteristics	Majority White Male	Majority White Female	Minority Male	Minority Female	Handicapped	Elderly	Youth
Income							
Poverty Level	X	X	X	X	X	X	X
Moderate					·		
Above Median					?		
Physical Condition							
No Impairments							
Ambulatory but requiring some assistance	?	?	?	?	?	?	·
Ambulatory but requiring mobility aids	·	·	·	·	·	·	·
Wheelchair	X	X	X	X	X	X	X
Institutionalized	X	X	X	X	X	X	X
Place of Residence							
Central City - Ghetto/Barrio							
Central City - Other							
Suburb - Close in							
Suburb - Fringe and Rural	·	·	·	·	·	·	
Place of Employment							
Downtown							
Other Central City							
Suburb - Close In	?	?	?	?	?	?	
Suburb - Fringe and Rural	X	X	X	X	X	X	
Auto Accessibility							
Auto Available					?		
Auto Not Available	·	·	·	·	·	·	

main trunk bus lines and rapid transit lines run. Those minorities that are also low income or handicapped may be considered transportation disadvantaged. But the term is simply not appropriate for entire races or classes of people.

The elderly are similar with regard to transportation disadvantage. Age per se will not qualify one as transportation disadvantaged. Age must be accompanied by low income and/or physical disability for one to be properly designated transportation disadvantaged. Yet it must be pointed out that the elderly are much more likely to be either poor or infirm than younger persons. But age, like race, does not make one ipso facto transportation disadvantaged.

A somewhat similar argument can be made for those handicapped who are not severely disabled. Some disabilities may be slight, or of a temporary nature and do not impede personal mobility, or the ability to hold a job or engage in other social activities. However, there are many categories of disabilities. It is not an easy task to determine just who among the disabled is serious enough to warrant special or preferrential treatment in regard to the transportation system.

The question whether or not women are a special category of disadvantaged person is even more subtle than any of the other categories. Certain stereotypes come to mind in considering women among the transportation disadvantaged. At one extreme is the female household head with low income, possibly on public assistance. Such a person would probably qualify as transportation disadvantaged using the criteria as already outlined. But the disadvantage would accrue to the low income and dependency status, and not necessarily to sex. At another extreme is the suburban housewife, with only one car in the family. The husband

takes the car to work, and leaves the woman "stranded." Since public transit may not be available, is this woman then among the transportation disadvantaged? Taken literally such a woman may, by our criteria, be transportationally disadvantaged. But is this situation serious enough for much concern? Or is this another variant on the concept of lack of income creating the dependency? Certainly the statistics on automobile ownership show that 80 percent of households have more than one auto. And for those households with incomes over $10,000, the auto ownership rises to 92 percent. Here again there is no clear answer as to just what constitutes the disadvantage.

The last category of persons to be considered is children. Just how are children transportationally disadvantaged, individually or as a group? Children under 16 cannot obtain drivers licenses, so cannot have direct access to a personal auto. Young children are also not likely to have jobs or independent incomes, or generous allowances. Their status is inextricably bound to their parents. Children in poverty households are disadvantaged. Children in affluent households are probably not disadvantaged, either socially or in terms of transportation. Even in affluent households the relative lack of mobility of children is more a function of the mores of society, what they can, cannot or are expected to do, rather than any aspect of the transportation system. Thus it is very difficult to make any kind of a persuasive case that children as a class of persons are transportationally disadvantaged, even those whose mobility is restricted by lack of auto access or suburban residence.

Transportation and Societal Disadvantage

The term transportation disadvantaged, though a euphemism, has evolved because of a very special need. Although the term has shortcomings, its appearance in the lexicon was inevitable. There are very valid reasons for considering transportation planning in a context of the relative status of various disadvantaged groups in society. It is just unfortunate that they have all been lumped together and called "transportation disadvantaged" when their real names are black, Chicano, Puerto Rican, severely disabled, elderly and poor.

For reasons of equity we must consider the impacts of our transportation system on all persons and groups, including the disadvantaged. Our democratic conception of horizontal equity implies that equals be treated equally. In terms of transportation planning this may take such forms as ensuring that all modes of transportation be accessible and available to all persons. A transportation system should offer equal opportunities to all citizens to commute to work, to shop and to recreate, at least to have the mobility to do so if one chooses.

Another equity consideration is that of distribution, or who benefits from the public transportation system. Here is where our real concern with the term disadvantage lies. The transportation system should not exacerbate differences in social status and income. A transportation system should serve both rich and poor, both the handicapped and those in good health, both young and old and both sexes with equanimity. It should not perpetrate imbalances. To do otherwise is inequitable.

One harsh criticism of BART is that it does not serve all groups equally. It appears to many that it is overwhelmingly a service to well-to-do commuters and not a service for the poor or for minorities.

These allegations may or may not be true. However, they can only be addressed by looking at the distributional consequences of the system. And in so doing, special attention must be paid to all of those groups of people who are disadvantaged by their status in society: the poor, minorities, handicapped, elderly, women and youth. But as previously noted only a tenuous case at best can be made that most of the aforementioned groups are really "transportation disadvantaged." Minorities, elderly, handicapped, women and youth have certain general disadvantages vis-a-vis society which make them of special concern, in an equity sense, in planning a transportation system.

With this in mind the BART impact studies should continue to concentrate upon assessing the impacts of the system on all disadvantaged groups. Equity considerations demand that this be done. As the BART Impact Studies go on, the term "transportation disadvantaged" should be dropped, unless it is referring to a specific and narrow group of poor and severely handicapped who are by nature of extreme poverty and extreme disability truly transportation disadvantaged. The term should not be used as a euphemism for minorities or women or the elderly. As a euphemism, it is entirely inappropriate for serious research. There is really no need for such euphemisms. There is far less chance for misunderstanding if we use the terms black, Negro, white, Mexican, Asian, Chinese, Chicano, disabled, handicapped, elderly, senior citizens, youth and women. These terms mean something, and are descriptive of an identifiable group of people whose well being is important.

Appendix A

ISSUES AND/OR PROBLEMS RELATED TO BART AND DISADVANTAGED GROUPS

The following is a listing of observations, impressions, declarations and opinions gathered from diverse sources which have something to do with the BART system and are on the face somewhat plausible. It is therefore a "laundry list" of what is on the minds of many minority and/or disadvantaged people when BART is brought up as a subject for discussion.

Community Structure and Community Development Issues

1. BART is accelerating the concentration of minorities in the central cities. An example often cited is the movement of Asians into the Richmond section of San Francisco. It is thought that many of the middle income white families that are leaving are moving to Contra Costa County where they will take BART back to their jobs in San Francisco. The proposed new residential development on San Bruno Mountain, near South San Francisco, and near the Daly City BART station, has a marketing plan to capture families from the western part of San Francisco. Does BART figure prominently in this? Some say yes.

2. BART encourages the upgrading of neighborhoods. While this may presently be the case only in some places, many people seem to believe that ultimately this is bound to happen in all the residential neighborhoods around BART stations.

3. BART encourages higher densities around stations. In some of the suburban stations this may be happening. However, this is thought

of as something to be resisted at some station areas in the central cities, notably Rockridge and the Mission.

4. BART is causing displacement of minority households around stations. There is still apprehension among many minority residents that suburban whites covet the areas around the stations, and that real estate interests are secretly buying up land and plotting to build new all white residential enclaves.

5. BART encourages competition which is detrimental to shopping districts in minority areas. There is some concern that downtown, by becoming more accessible, will offer greater competition to outlying stores. In the Mission the closing of the Sears and Lachman Furniture stores are related somehow to BART by some observers.

6. BART has disrupted many businesses and forced many of them to close. This contention is voiced in the Mission because of the disruption of Market Street, a condition which has persisted for several years.

7. BART has exacerbated neighborhood parking problems. This is true around the Mission stations currently. If BART charges for parking many people are fearful that BART users will begin to park in neighborhoods even though the BART lots will not be full. This would affect many minority neighborhoods.

Environmental, Aesthetic and Psychological Concerns

1. BART is noisy and reduces the quality of life around its tracks.

2. BART increases neighborhood congestion, especially at peak hours around the stations.

3. BART is often a divisive barrier as it passes through some neighborhoods.

4. BART stations may not be safe if evening service begins.

5. BART is sensed as an intrusion into some minority communities.

6. BART is cold and unfriendly. This complaint frequently surfaces whenever the subject of low minority patronage is mentioned. Many people feel that the mechanized nature of the operation presents a hostile face to minorities and handicapped persons. Handicapped complain of the constant "hassle" from trying to use the ticket and change machines, as well as trying to enter and use the elevators.

7. The architecture of the system is alien and intimidating to minorities, especially the elderly minorities.

Employment and Business Opportunities

1. BART enables minorities to work in suburban office and industrial centers. This is possible and some observers feel that it is happening.

2. BART may lead to increased minority business opportunities at and around stations. This is not very evident so far, but it is a possibility.

3. BART has put more people out of work than jobs have been created. This was stated frequently in the Mission, where there has been extensive disruptions caused by the construction.

4. BART provides little or no direct employment (on BART's own work force) for minority residents.

5. BART will lead to an increased number of low paying jobs around the BART stations and downtown.

BART Patronage and Ridership

1. There is a "systemic imbalance" in the direction of travel. This means that blacks (or other minorities) may be traveling one way and whites the other at different times in the day.

2. BART has too few stations in minority areas. There are strident criticisms of BART for bypassing Hunters Point. It has also been pointed out that there is only one station between the Coliseum and downtown which means that minorities in that part of Oakland have a long bus ride to get to the station, which may be a factor in the low minority patronage of the system.

3. There is not enough coordination between AC Transit and Muni and BART. This lack of coordination in the cities is viewed as another cause of low minority ridership.

4. BART shows a lack of sensitivity to travel needs of minorities by not offering night and weekend service. Many more minorities would use the system if greater service were offered.

5. The BART fare is too high for many minority families to pay. Even the 30 cents fare in San Francisco is too high. It is thought that a lower fare would greatly increase minority patronage.

6. The buses which run through minority areas still seem crowded in spite of the BART operation.

7. There is a general lack of patronage of BART by minorities. At

least it appears that minorities do not constitute the ridership in proportion to their numbers in the population.

Fiscal Issues

1. BART will force out poor minorities in neighborhoods around stations because it will lead to higher property taxes. In the Mission some residents feel that the recent large increases in property taxes are related to BART. The irony is that local residents don't seem to really utilize the two Mission stations.

2. A disproportionate burden for financing BART's deficit falls on the poor, minorities and handicapped persons, who utilize the system least.

Other Issues

1. BART will be of particular benefit to suburban women, who will be "freed" and able to use the family car since the husband will take BART.

2. Handicapped will not be able to utilize BART even though it is supposed to be barrier free. The feeder buses are not equipped to handle wheelchairs or those with other severe disabilities. Also most of the world outside the stations does not provide access to the handicapped. Most of the time there are no curb cuts, ramps and elevators outside the stations. So what use is BART to the handicapped if their origins or destinations are any distance from the stations?

As mentioned previously, this is merely a listing of the more prominent points which have been made in connection with the BART system. Some are already subjects of inquiry. Some will be studied

as parts of BART Impact Studies which have yet to be started. Whether or not these opinions, observations, and impressions are true is not the issue here. But if sizeable numbers of people have these impressions, then they should be tested in some part of the BIP.

Appendix B

Location of Disadvantaged Groups in the San Francisco-Oakland-San Jose SMSAs

The following section is an analysis of the geographic locations of various disadvantaged groups: minorities, elderly, and handicapped.

The racial minorities are readily located because the Census publishes detailed counts by race for Census tracts. These data are plotted on a series of maps which accompany this narrative.

Analysis of the region's black population shows that there are major concentrations in San Francisco (Hunters Point and the Western Addition), Oakland, Berkeley, and Richmond in the East Bay. In addition, there are smaller outlying concentrations of black families. In Marin County there is a small concentration of black families in an unincorporated section known as Marin City. San Mateo has medium sized black communities in East Menlo Park (a section of the city of Menlo Park) and East Palo Alto, an unincorporated section of the county. In Solano County there is a small black community in the city of Vallejo. In eastern Contra Costa County there is a large number of black families in the city of Pittsburg.

Significant concentrations of Spanish Surname families are found in and around San Jose. Within the city of San Francisco, the most concentrated area of Spanish Surnames is found in the Mission, a centrally located part of the city. In Alameda County the largest concentration of Spanish Surnames is found in the Union City/Hayward area.

For Asians the most concentrated community is Chinatown in San Francisco. However, Asians are spread throughout the city of San

Table 1A

Selected Population Statistics 1970 San Francisco-Oakland-San Jose SMSAs

	Total Number	Black	Spanish Surname	Other	Total Minorities	Median Income
Alameda County	1,073,184	15.0%	12.6%	4.9%	32.5%	$10,502
Oakland	361,561	34.5	9.8	6.3	50.6	9,626
Berkeley	116,716	23.5	5.5	7.9	36.9	9,987
Fremont	100,638	.4	16.4	2.8	19.6	12,677
Hayward	93,058	1.8	20.3	4.0	26.1	11,101
Contra Costa County	558,389	7.4	9.3	2.3	19.0	12,423
Concord	85,164	.4	7.1	1.8	9.3	12,614
Richmond	79,043	36.4	10.1	3.1	49.6	10,362
San Francisco	715,674	13.4	14.2	14.9	42.5	10,502
Total BART Service Area	2,347,247	12.5	12.3	7.3	32.1	10,948
San Mateo County	477,243	4.9	11.9	3.6	20.4	13,222
Marin County	206,038	2.4	5.8	1.8	10.0	13,934
Total San Francisco-Oakland SMSA	3,109,519	10.6	11.7	6.3	28.6	11,802
Santa Clara County	1,064,714	1.7	17.5	3.7	22.9	12,455
San Jose	445,772	2.5	21.9	3.6	28.0	11,913
Sunnyvale	95,408	.7	13.3	4.7	18.7	13,077
Santa Clara	87,717	.6	18.1	3.1	21.8	12,134
Total San Francisco-Oakland-San Jose SMSAs	4,174,233	8.3	13.2	5.6	27.1	11,966

Francisco. The other significant concentration of Asians is in Oakland, which also has a section known as Chinatown, though not nearly as large as the one in San Francisco.

The accompanying maps not only show minority concentrations, but also show them in relation to the BART tracks and stations. It is apparent that much of the BART system goes directly through concentrations of minorities. Also many stations are located in areas of high minority concentration.

In order to provide a better description of the BART system in relation to minorities the following section will give a statistical description of the immediate environment within a one half mile radius of each station, This is a better way to determine the character of the neighborhood around the stations. Table 2A shows that 11 of 34 stations are in areas which have more than 50 percent minority residence and 17 of 34 stations are in areas of more than 40 percent minority residence.

Location of Other Disadvantaged Groups

Racial minorities are easily located geographically. However, this is certainly not the case with the handicapped, elderly or poor whites. Those groups appear to be evenly distributed throughout the population.

Apparently there are no good locational data on the handicapped. During my investigations I could uncover no such census. There are, of course, estimates of the gross number of handicapped on a national basis but no such reliable numbers for small areas. One reason stems from the lack of uniform definitions of just who is handicapped and would be counted. There are many fragmented social service agencies, and each has

Table 2A

Selected Characteristics of the Population Within a Half Mile Radius of BART Stations

Station	Population					Income
	Total Population	Black	Spanish Surname	Other	Total Minority	
1. Concord	5,650	0.0	7.0	2.2	9.2	$11,215
2. Pleasant Hill	3,166	0.2	7.0	2.6	9.8	13,346
3. Walnut Creek	3,600	0.3	6.4	1.8	8.5	10,744
4. Lafayette	--	0.3	3.5	1.2	5.0	16,400
5. Orinda	--	0.0	3.2	0.5	3.7	21,474
6. Rockridge	9,237	16.0	4.2	3.2	23.4	8,023
7. Richmond	8,914	27.6	16.4	1.6	45.9	8,041
8. Del Norte	5,585	15.8	7.2	8.6	31.6	13,272
9. El Cerrito Plaza	9,250	2.4	7.8	5.3	15.5	15,176
10. North Berkeley	11,553	25.7	8.2	14.3	48.2	9,398
11. Berkeley	20,813	7.0	4.8	10.0	21.8	7,187
12. Ashby	20,215	59.1	4.2	3.4	66.7	7,756
13. Fremont	2,039	0.0	15.0	2.0	17.2	11,167
14. Union City	--	0.0	86.0	2.0	88.0	8,400
15. South Hayward	1,519	0.2	21.7	2.7	24.6	9,562
16. Hayward	4,565	0.2	36.3	2.7	39.2	9,175
17. Bayfair	7,883	0.1	18.5	2.8	21.4	10,710
18. San Leandro	5,976	0.0	23.3	2.2	25.5	10,320
19. Coliseum	6,548	82.7	9.5	3.2	95.4	5,707
20. Fruitvale	6,624	18.9	37.2	6.8	62.9	7,108
21. Lake Merritt	5,158	10.5	4.9	33.7	49.1	7,965
22. MacArthur	11,027	63.7	8.9	4.7	77.3	9,265
23. 19th Street	9,441	22.4	7.0	5.6	35.0	7,626
24. 12th Street	7,921	25.2	9.7	16.8	51.7	7,334
25. West Oakland	6,295	89.4	5.0	1.6	96.0	4,711
26. Daly City	10,417	25.5	19.0	8.7	53.2	10,373
27. Balboa Park	14,686	11.8	20.5	8.8	41.1	10,952
28. Glen Park	13,851	5.0	26.3	12.2	43.5	11,186
29. Mission-24th	32,050	3.0	41.4	10.2	54.6	8,070
30. Mission-16th	31,341	7.3	37.6	14.7	59.6	7,282
31. Civic Center	30,816	10.8	11.3	11.7	33.8	6,306
32. Powell Street	21,829	3.7	8.9	15.9	28.5	7,450
33. Montgomery Street	25,919	1.7	5.3	50.2	57.2	7,416
34. Embarcadero	11,795	1.8	4.9	50.0	56.7	9,387

a list of its clients. But no person has as yet compiled a master list from all of the various service and health agencies. This would certainly be a Herculean task should someone ever undertake it.

The Census of 1970 did ask three questions relating to occupational disability. If it can be assumed that these responses form an appropriate universe of the handicapped then this might be the basis of such a geographic listing of handicapped. However, these data on the handicapped are not published in any of the Census publications on the basis of census tracts. The information is on tape, and it would be possible for a special census tract output to be obtained which would locate the handicapped (at least the Census version). However, such information would not give the nature of the handicap. In my research I could not discover any group that had yet obtained such a print-out from the Census.

The elderly are another group that is difficult to identify from census tract data. A perusal of census tract data reveals that the elderly tend to be rather evenly distributed throughout the metropolitan area. There are very few census tracts which appear to be heavily composed of elderly. There are a few exceptions of course. It appears that some census tracts in central San Francisco have more than 20 percent of their residents over 60 years of age. But finding such tracts is very difficult. The Census is useful in identifying the large retirement subdivisions, such as Rossmoor in Walnut Creek. This tract certainly sticks out, since it has no young people in it. But this is the rare exception.

Of course there are various homes for the elderly and retirement communities located throughout the metropolitan area. But from an over-

all viewpoint they tend to get lost in the aggregate statistics. Even census tracts seem too big to really identify them. It seems safe to say that, with the exception of a few large retirement communities, the elderly are distributed rather evenly and proportionally throughout the metropolitan area. This does not mean that there are not certain favored kinds of locations for many of the elderly, but any pattern of location of the elderly cannot be identified from looking at census tract data.

Poor whites are also extremely difficult to find. We know that they are there, since the Census reports that in 1970 17 million white persons were below the poverty level. But one characteristic of poor whites is that they are not ghettoized to the extent of other minorities. The concentrations of poor whites are usually not large enough to assume their own identities like Chinatown or Hunters Point. Examination of census tract data bears out these points. There are hardly any census tracts in the San Francisco-Oakland SMSA where the poverty incidence is clearly not the result of the presence of minorities. The census tracts with the highest incidence of poverty are minority tracts. At least the poverty incidence is most often easily correlated with the presence of minority groups. It is very difficult to find census tracts with large numbers of poverty households and small numbers of minority households. From such a situation it might be easily inferred that the large poverty incidence was due to poor whites. But this situation is hard to detect.

The obvious interpretation from the census tract data is that poor whites do not exist in concentrations large enough for them to be clearly identified. If they tend to be concentrated, like poor minorities, the concentrations are too small to be readily detected by the census tracts.

Perhaps a more precise location of the handicapped, elderly and poor whites may be one of the tasks which might be done as part of a larger future study.

FOOTNOTES

[1]L. Grebler, J. W. Moore and R. C. Guzman, The Mexican-American People (New York: Macmillan, 1970), p. 24.

[2]D. L. Foley, "Differentials in Personal Access to Household Motor Vehicles: Five County San Francisco Bay Area, 1971," Working Paper No. 197/BART 9, Institute of Urban and Regional Development, University of California, Berkeley, California, 1972.

[3]H. Zukas, "Why Aren't Disabled People Using BART?", unpublished paper, January, 1974.

[4]S. S. Ridge, "Estimating Need for Rehabilitation Services," Working Paper No. 182/RS009, Institute of Urban and Regional Development, University of California, Berkeley, California, August 1972.

[5]Alameda/Contra Costa County Transit District, "Eligibility Criteria for the Handicapped," mimeo, May 2, 1975.

[6]U. S. Department of Health, Education and Welfare, Office of Research and Statistics, From the Social Security Survey of the Disabled: 1966.

[7]Questions asked in the 1970 Census were:

1. Does this person have a health or physical condition which limits the kinds or amount of work he can do at a job?

2. Does the health or physical condition keep him from holding any job at all?

3. How long has he been limited in his ability to work?

[8]D. Kulash and W. Silverman, "Discrimination in Mass Transit." The Urban Institute, Working Paper Number 712-10, February 1974, Washington, D. C.

[9]T. Duster, "Issues in the Study of the Travel Behavior of Minorities," Technical Memorandum prepared by Jefferson Associates (December 1974) for Peat, Marwick and Mitchell under contract to Metropolitan Transportation Commission for Transportation and Travel Behavior, BART Impact Program.